SHIFT OF ATMOSPHERIC TRANSPORT PATTERNS OVER THE LAST 50 YEARS OBSERVED FROM SEA-SALT RECORDS IN NORTHERN GREENLAND ICE CORES

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Chemical records from polar regions represent a most important archive for paleoatmospheric research. The information archived in aerosol chemistry records of polar ice cores is influenced by a series of factors such as aerosol production, long range transport, aerosol deposition and postdepositional changes. For the interpretation especially the influence of atmospheric circulation patterns is most relevant. In order to extract the net atmospheric information stored in three high resolution northern Greenland ice core records, their interannual variability is investigated, and contrasted to northern hemispheric NCEP reanalysis data. This analysis reveals that sea salt records are significantly influenced by atmospheric circulation patterns. Over the time span from 1950-1970 correlation analysis with annual and wintertime averages of sea level pressure and geopotential height at the 500 mbar level identifies the north Atlantic as significant centers of action responsible for sea salt export onto the Greenland ice sheet. After 1970 a clear shift of these centers to northern and western Pacific is recognizable.